1. (Twice Amended) A 2000 series aluminum alloy consisting essentially of in weight per cent about 3.60 to 4.25 copper, about 1.00 to 1.60 magnesium, about 0.30 to 0.80 manganese, no greater than about 0.05 silicon, no greater than about 0.07 iron, no greater than about 0.06 titanium, no greater than about 0.002 beryllium, the remainder aluminum and incidental elements and impurities, wherein a T_{max} heat treatment is below the lowest incipient melting temperature for a given 2000 series alloy composition and the Cu_{target} is determined by the expression:

$$Cu_{target} = Cu_{eff} + 0.74(Mn - 0.2) + 2.28(Fe - 0.005)$$

wherein said alloy maintains the yield strength and improves by a minimum of 5% compared to the average values of standard 2324-T39 alloy shown in Fig. 1 for the same properties selected from the group consisting of the plane strain fracture toughness, K_{Ic}, the plane stress fracture toughness, K_{app}, the stress intensity factor range, ΔK at a fatigue crack growth rate of 10 μ-inch/cycle wherein R = 0.1 and RH is greater than 90%, and combinations thereof.

2. (Amened) A 2000 series aluminum alloy consisting essentially of a composition within the box of W, X, Y, and Z as defined in Fig. 5, wherein T_{max} for each composition corner point is about W = 925°F, X = 933°F, Y = 917°F, and Z = 909°F, wherein Cu_{target} is defined by the following equation:

$$Cu_{target} = Cu_{eff} + 0.74(Mn - .03) + 2.28(Fe - 0.005)$$

30 ~~40~~. (Amened) The 2000 series aluminum alloy of claim 1 where in said ΔK at a fatigue crack growth rate of 10 μ-inch/cycle improves by a minimum 1.00 ksi$\sqrt{in}$ with R equal to 0.1 and RH greater than 90%.